Aviation Investigation Final Report

Location:	Tuntutuliak, Alaska	**Accident Number:**	ANC20FA017
Date & Time:	February 6, 2020, 11:10 Local	**Registration:**	N7632C
Aircraft:	Piper PA32R	**Aircraft Damage:**	Substantial
Defining Event:	Controlled flight into terr/obj (CFIT)	**Injuries:**	5 Fatal
Flight Conducted Under:	Part 135: Air taxi & commuter - Scheduled		

Analysis

The commercial pilot departed under a special visual flight rules (VFR) clearance with four passengers on a VFR scheduled passenger flight. The airplane was reported overdue about an hour later when it had not reached its destination and was subsequently located about 35 nautical miles from the departure airport. There was no radar or other flight tracking information available for the accident flight, and the airplane's flight track before the accident could not be determined; however, the wreckage was located along a direct course between the departure and destination and on a heading consistent with the intended direction of flight. The airplane was highly fragmented and the wreckage was distributed along a nearly 400-ft-long debris path. Examination of the airplane and engine did not reveal any evidence of mechanical malfunctions or anomalies that would have precluded normal operation.

The weather about the time of departure included 1 ¼ miles visibility, a runway visual range of 2,200 ft to better than 6,000 ft, unknown precipitation and mist, and an overcast ceiling at 600 ft above ground level (agl). The observation closest to the accident time indicated 3 miles visibility, mist, and an overcast ceiling at 500 ft agl. Between the departure time and the accident time, instrument flight rules or low instrument flight rules conditions prevailed at the departure airport. In the hour after the accident, both the departure and intended destination airports reported low instrument flight conditions with visibility as low as ½ statute mile in light snow, mist, and freezing fog, and cloud ceilings as low as 400 ft agl.

An atmospheric sounding depicted a stable atmosphere with cloud bases around 700 ft agl. A frontal inversion was collocated between the lifted condensation level, around 700 ft agl, and 3,000 ft mean sea level. The wind profile suggested the potential for low-level turbulence based on the low-level wind maximum and the strong vertical shear near the inversion and a 77% probability of moderate to severe turbulence at 700 ft due to the strong vertical wind shear. It is also likely that light to moderate rime icing conditions were present in clouds and precipitation.

The pilot had been recently hired by the operator and had completed initial operating experience requirements the week before the accident. Interviews with the director of operations, general manager, and the flight follower who assigned the accident flight indicated that company policy required a minimum of 2 statute miles visibility and a cloud ceiling of at least 500 ft agl. Pilots were required to complete a flight risk assessment form before each flight, which was to be approved or disapproved by the director of operations or their delegate before the flight was released. No risk assessment form was located for the accident flight, and who approved the flight to depart could not be determined.

Based on the available information, a lack of operational control permitted the pilot to depart into weather conditions that were below the minimums specified by company operating procedures. It is likely that, while en route, the pilot encountered adverse weather including low visibility, precipitation, and turbulence. Such conditions, in addition to the snow-covered terrain and overcast and/or low visibility likely present at the time of the accident, would have been conducive to flat light or white-out conditions. In these conditions pilots can experience illusions that can lead to unrecognized descents because of the difficulty discriminating between terrain and sky to identify a visible horizon. With the low ceilings likely en route, the pilot would have been flying at altitudes that would have precluded recognition and recovery from an inadvertent descent.

The direction, distribution and fragmentation of the wreckage was consistent with a controlled flight into terrain event.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The pilot's continued visual flight rules flight into reduced visibility, including likely flat light and/or white out conditions, which resulted in a controlled flight into terrain. Contributing to the accident were the operator’s inadequate operational control procedures, which permitted the pilot to depart into conditions that were below the minimums specified by their operating procedures.

Findings

Personnel issues	Decision making/judgment - Pilot
Environmental issues	Whiteout - Effect on personnel
Environmental issues	Flat light - Contributed to outcome
Organizational issues	Adherence to safety program - Operator
Personnel issues	Use of policy/procedure - Flt operations/dispatcher
Environmental issues	(general) - Decision related to condition
Organizational issues	Oversight of operation - Operator

Factual Information

History of Flight

Enroute-cruise	Controlled flight into terr/obj (CFIT) (Defining event)
Enroute-cruise	Loss of visual reference
Prior to flight	Preflight or dispatch event

On February 6, 2020, about 1110 Alaska standard time, a Piper PA-32R-300 airplane, N7632C, was substantially damaged when it was involved in an accident near Tuntutuliak, Alaska. The commercial pilot and four passengers were fatally injured. The airplane was operated by Paklook Air Inc., doing business as Yute Commuter Service, as a Title 14 *Code of Federal Regulations* Part 135 scheduled passenger flight.

The flight originated from Bethel Airport (PABE), Bethel, Alaska, about 1040, and was destined for Kipnuk Airport (PAKI), Kipnuk, Alaska, a distance of about 82 nautical miles (nm). According to the company flight following log, the pilot reported that he was outbound at 1034. A pilot from another company stated that the accident airplane departed right before his airplane under a special visual flight rules (VFR) departure clearance and that the cloud ceiling at the time was overcast at 600 ft above ground level (agl).

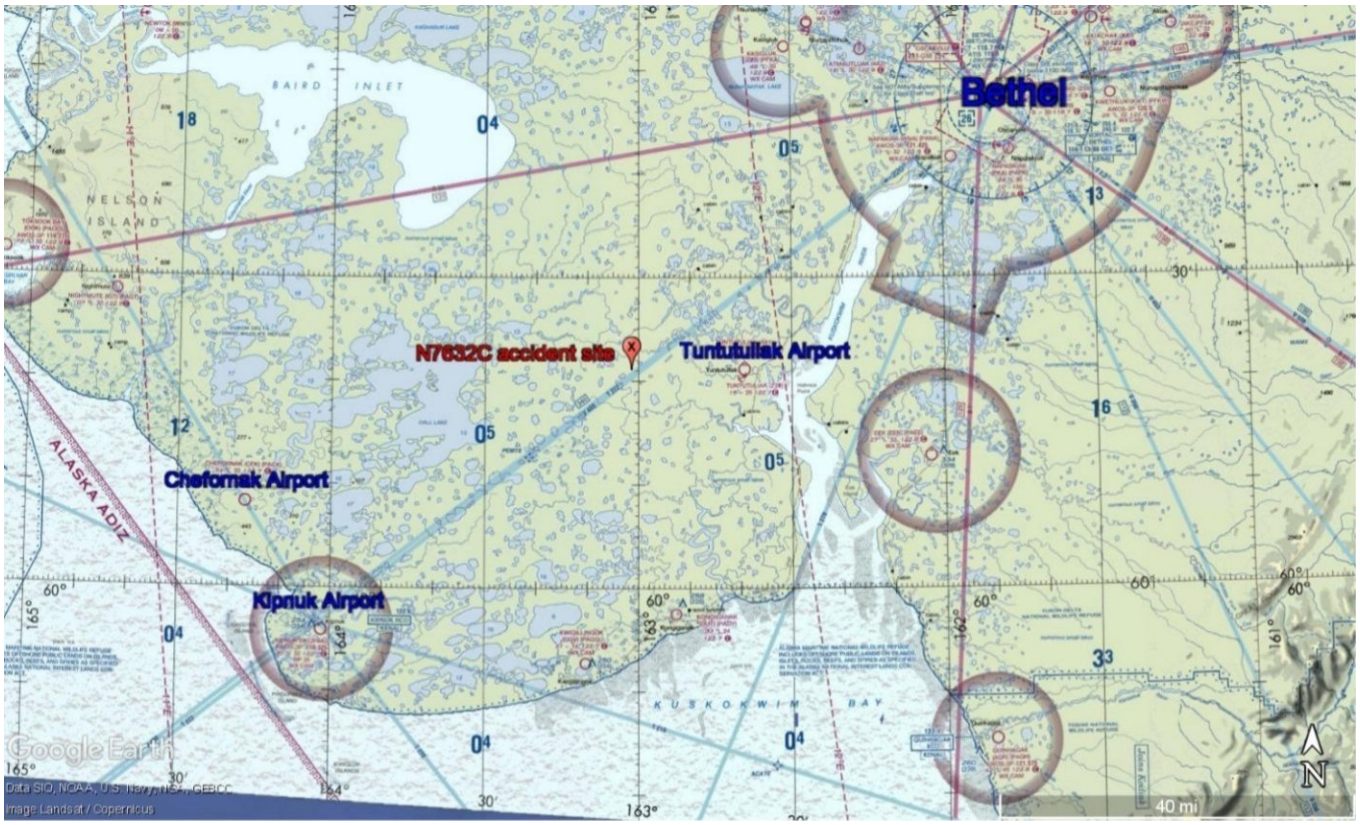

Figure 1. The accident site and route airports

According to the company's flight-following notes, the village agent from PAKI called the company flight follower at 1140 and reported that the airplane was overdue. The company president, who was exercising operational control over flights at the time of the accident, initiated overdue airplane procedures. About 1315, the company dispatched two airplanes to search for the missing airplane. A crew located the wreckage along the route from PABE to PAKI.

There was no radar coverage in the area of the accident site, and the airplane was not equipped with any GPS devices that recorded nonvolatile memory; therefore, flight track information for the accident flight was not available.

Pilot Information

Certificate:	Commercial; Flight instructor	**Age:**	34,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Front
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Instrument airplane	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 Without waivers/limitations	**Last FAA Medical Exam:**	January 3, 2020
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	(Estimated) 645 hours (Total, all aircraft), 34 hours (Total, this make and model), 550 hours (Pilot In Command, all aircraft), 34 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

According to the operator, the pilot had a total of 645 hours of flight experience, of which 34 hours was in the accident airplane make and model.

The pilot began initial training with Paklook Air on January 7, 2020, completed a pilot competency check ride on January 28, and completed initial operating experience requirements on January 30. The accident flight was his fourth line flight.

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N7632C
Model/Series:	PA32R 300	**Aircraft Category:**	Airplane
Year of Manufacture:	1975	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	32R-7680054
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	October 7, 2019 Annual	**Certified Max Gross Wt.:**	3600 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	7766.3 Hrs as of last inspection	**Engine Manufacturer:**	Lycoming
ELT:	C126 installed, not activated	**Engine Model/Series:**	IO-540-K1G5D
Registered Owner:	Paklook Air Inc	**Rated Power:**	270 Horsepower
Operator:	Paklook Air Inc	**Operating Certificate(s) Held:**	Commuter air carrier (135), On-demand air taxi (135)
Operator Does Business As:	Yute Commuter Services	**Operator Designator Code:**	T72A

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	PABE,102 ft msl	**Distance from Accident Site:**	44 Nautical Miles
Observation Time:	19:53 Local	**Direction from Accident Site:**	53°
Lowest Cloud Condition:		**Visibility**	5 miles
Lowest Ceiling:	Overcast / 800 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	4 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	320°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.68 inches Hg	**Temperature/Dew Point:**	-16°C / -17°C
Precipitation and Obscuration:	Moderate - None - Mist		
Departure Point:	Bethel, AK (BET)	**Type of Flight Plan Filed:**	Company VFR
Destination:	Kipnuk, AK (IIK)	**Type of Clearance:**	Special VFR
Departure Time:		**Type of Airspace:**	Class E

The 1043 weather observation at PABE included 1 ¼ miles visibility, a runway 19R visual range of 2,200 ft to better than 6,000 ft, unknown precipitation and mist, and an overcast ceiling at 600 ft above ground level (agl). The 1105 observation, closest to the accident time at 1110,

indicated 3 miles visibility, mist, and an overcast ceiling at 500 ft agl. Between the departure time and the accident time, instrument flight rules or low instrument flight rules conditions prevailed at PABE.

The destination airport, PAKI, was located about 39 miles southwest of the accident site. The 1056 weather observation included wind from 020° at 17 knots; 9 statute miles visibility in light snow; overcast clouds at 600 ft agl; temperature -8°F; dew point -11°F; and an altimeter setting of 29.70 inches of mercury.

In the hour after the accident, both the departure and intended destination airports reported low instrument flight conditions, with visibility as low as ½ statute mile in light snow, mist, and freezing fog; and cloud ceilings as low as 400 ft above ground level.

An upper air sounding was plotted for PABE using the complete Rawinsonde Observation (RAOB) program software. The sounding depicted a stable atmosphere with cloud bases around 700 ft agl. A frontal inversion was collocated between the lifted condensation level around 700 ft agl, and 3,000 ft. The wind profile suggested the potential for low-level turbulence based on the low-level wind maximum and the strong vertical shear near the inversion. The RAOB algorithm indicated a 77% probability of moderate to severe turbulence at 700 ft due to the strong vertical wind shear. The table also indicated that light to moderate rime icing conditions were likely in clouds and in precipitation.

The area forecast for the region of the accident site included an AIRMET for IFR conditions with occasional visibility below 3 miles in light snow and mist, and an AIRMET for mountain obscuration conditions in clouds and precipitation, with conditions expected to improve with time.

The FAA weather camera program includes 230 weather cameras across Alaska intended as a supplementary product to improve situational awareness. The camera images are updated every 10 minutes and are designed to assist pilots in making critical weather evaluations.

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:	4 Fatal	**Aircraft Fire:**	None
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	5 Fatal	**Latitude, Longitude:**	60.351665,-163.02305(est)

The wreckage was highly fragmented and extended about 390 ft along a west-southwesterly heading on level, snow-covered tundra at a GPS elevation of 37 ft. All major components of the airplane were located at the scene. The wings were separated from the fuselage, with extensive damage to the right wing, which was in three sections. The main wreckage was located at the west end of the debris pattern and comprised the upright fuselage, empennage, and engine sections. The engine and forward fuselage were displaced 80° to the right with extensive fore-to-aft crush damage.

The airplane was recovered from the site and examined at a secure facility. Control cable continuity was established from the cockpit controls through impact and overload separations to the control surfaces.

The engine displayed significant impact damage but remained attached to the crushed engine mount. Additional impact damage was observed to the oil sump and the No. 2 cylinder head. The fuel servo was impact separated from the engine. The dual magneto, vacuum pump, and propeller governor remained mounted to their respective mounting pads and appeared undamaged.

An Electronics International CGR-30P engine monitor was recovered from the wreckage and sent to the NTSB Recorders Laboratory for download. Review of the data for the accident flight revealed nominal engine operation with no evidence of any mechanical malfunctions or anomalies. Engine rpm, manifold pressure, and fuel flow values for the last approximate 20 minutes of recorded data were all consistent with cruise flight.

Organizational and Management Information

The operator's general manager was interviewed following the accident, during which he was asked about the company's dispatch and operational control procedures. He said that newly-hired pilots were usually subject to "limitations" that were typically set by the director of operations or the chief pilot, whoever conducted the pilot's initial hire training; however, at the time of the accident, there was no procedure for recording or communicating these limitations to the individual who may dispatch a flight.

He reported that, on the morning of the accident, he spoke with the dispatcher for the accident flight around 0725 or 0730 and they discussed the weather conditions, which he recalled were forecast to be marginal VFR or VFR "throughout the Delta."

He further stated that the company only conducted VFR flights and that their minimums were a 500-ft ceiling and visibility of 2 statute miles; however, "500 and 2 is not a condition that we want to be flying around in. That is to get safely on the ground from somewhere." He also

stated that a 1,000-ft ceiling and 5 miles visibility would be "more appropriate" weather conditions into which a new pilot could be dispatched.

The director of operations (DO) stated that he, the general manager, the chief pilot, and a senior pilot were the individuals delegated to exercise operational control over flights.

The DO stated that the accident pilot was not subject to any limitations at the time of the accident, and typically only the pilots who flew the operator's Cessna 172 airplanes were subject to restrictions. There was no risk assessment form found associated with the accident flight.

The flight follower who dispatched the accident flight reported that he did not recall whether the accident pilot completed a risk assessment form for the flight. He stated that the accident pilot waited in the dispatch office for "quite some time" before departing on the accident flight for weather conditions to improve. He could not recall the weather conditions at the time the accident flight departed, nor could he recall the conditions observed along the route of flight and at the destination airport before the flight departed.

According to the Paklook Air dba Yute Commuter Service General Operations Manual (GOM), the DO was responsible for the exercise of operational control, and was permitted to delegate flight assignment tasks to the chief pilot, a senior pilot, the general manager, or a qualified flight coordinator. Flight release could be delegated to the pilot-in-command and either the chief pilot, a senior pilot, general manager, or a qualified flight coordinator.

For any flight assignment, the DO or their delegate was responsible and authorized to suspend or terminate the initiation or continuation of a flight assignment if the flight would depart under conditions that were not compliant with federal regulations and/or the GOM, or if conditions posed a hazard to the safety of flight.

The GOM stated that the pilot-in-command (PIC) of a flight was responsible for obtaining weather information and determining if the flight could be conducted within required limitations. The PIC was also required to complete a flight risk assessment, which was then submitted to the flight coordinator, DO, or the DO delegate before the flight was released. The GOM stated that, "The PIC shall not depart until the flight risk point total is approved or denied before flight."

The GOM also stated that,

The purpose of flight risk assessment is to identify and quantify specific risks associated with a flight assignment. The Flight Risk Assessment form (YCS 412) is used to document the process.

- *YCS 412 is an intuitive form with point values assigned to factors that increase flight risk…*

Completion of the risk assessment is an integral part of the Company procedures for operational control. The form must be completed and authorized before departure…

The PIC shall use his best judgment to identify applicable risk factors for the proposed flight assignment based on information acquired during the flight release tasks. Guidelines for some of the qualitative risk elements shall be understood as:

- *-MVFR or "Marginal" VFR at departure and landing; special VFR flight rules at Bethel, or enroute conditions reported <1,000' ceiling or <3 miles visibility…*

Additional Information

According to FAA pamphlet, "Flying in Flat Light and White Out Conditions:"

Flat light is an optical illusion, also known as "sector or partial white out." It is not as severe as "white out" but the condition causes pilots to lose their depth-of-field and contrast in vision. Flat light conditions are usually accompanied by overcast skies inhibiting any good visual clues. Such conditions can occur anywhere in the world, primarily in snow covered areas but can occur in dust, sand, mud flats, or on glassy water. Flat light can completely obscure features of the terrain, creating an inability to distinguish distances and closure rates. As a result of this reflected light, it can give pilots the illusion of ascending or descending when actually flying level.

As defined in meteorological terms, white out is when a person becomes engulfed in a uniformly white glow. The glow is a result of being surrounded by blowing snow, dust, sand, mud or water. There are no shadows, no horizon or clouds and all depth-of-field and orientation are lost. A white out situation is severe in that there aren't any visual references. Flying is not recommended in any white out situation. Flat light conditions can lead to a white out environment quite rapidly, and both atmospheric conditions are insidious: they sneak up on you as your visual references slowly begin to disappear. White out has been the cause of several aviation accidents in snow-covered areas.

Administrative Information

Investigator In Charge (IIC):	Price, Noreen
Additional Participating Persons:	Hugh Youngers; Federal Aviation Administration; Anchorage, AK Wade Renfro; Paklook Air, Owner; Bethel, AK Mark Platt ; Lycoming Engines Kathryn Whitaker; Piper Aircraft, Inc. ; Vero Beach, FL
Original Publish Date:	September 7, 2022
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=100911

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, "accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties … and are not conducted for the purpose of determining the rights or liabilities of any person" (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB's statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available here.